

Fadely, Karen

From: Silawsky, Donald [Donald.Silawsky@hq.doe.gov]
Sent: Friday, October 28, 2005 10:15 PM
To: Fadely, Karen
Cc: Johnson, David
Subject: FW: "Scoping for the SPR EIS."
Expires: Saturday, October 28, 2006 12:00 AM
Attachments: Dow Comments 10-28-05.doc

<<Dow Comments 10-28-05.doc>>

KAREN: Another set of comments on the SPR EIS. Please acknowledge receipt.

DON SILAWSKY

-----Original Message-----

From: Bork, Paul (PM)
To: Silawsky, Donald
Sent: 10/28/2005 7:44 PM
Subject: "Scoping for the SPR EIS."

Please find the attached comments of The Dow Chemical Company.

<<Dow Comments 10-28-05.doc>>

Please let me know if you have any problems opening the comments or if you have any questions or concerns with these comments.

Paul Bork
EHS Legal - Freeport
EHS Legal - Mergers and Acquisitions
Six Sigma Black Belt - Legal



<<Dow Comments 10-28-05.doc>>

10/29/2005

2030 Building
October 28, 2005

The Dow Chemical Company
Midland, Michigan 48674

Donald Silawsky
Office of Petroleum Reserves (FE-47)
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0301
Donald.Silawsky@hq.doe.gov

Comments of The Dow Chemical Company in Response to Department of Energy's Notice of Intent and Extension of Comment Period (70 FR 52,088 and 56,649) for a Proposed Expansion of the Strategic Petroleum Reserve, Implementing Congress' Requirements Contained in The Energy Policy Act of 2005

Dear Mr. Silawsky,

The Dow Chemical Company (Dow) thanks the Department of Energy (DoE) for this opportunity to comment on the scoping for the Environmental Impact Statement (EIS). We have had extensive experience with the operation of the Strategic Petroleum Reserve (SPR), having initially shared the Brian's Mound location with the SPR and having some of our major manufacturing operations close to the SPT operations in Bayou Choctaw. A more extensive description of Dow is included in the attached Testimony.

Dow has been a frequent commenter on the SPR process, specifically, and the US national energy policy in generally. We participated in the public comment process leading up to The Energy Policy Act of 2005 (Energy Act) and are pleased to see DoE moving forward in implementing its obligations under the Energy Act. Dow has historically commented on DoE's prior EIS efforts. Dow incorporates into these comments its prior comments, which are in the DoE docket related to the prior EIS related to locating a new SPR oil storage facility in Stratton Ridge, Texas, by reference, as if repeated in full in these comments.

Dow understands that the comments being solicited by the cited *Federal Register* notices are limited to the scoping of the EIS. This will be the focus of these comments. Some aspects of our concerns with the Stratton Ridge potential location for the new SPR facility will be raised in other appropriate forums.

Dow includes two documents in these comments in an Appendix: the written testimony of Dow and ACC to the Senate Energy and Natural Resources (Testimony) and a letter from Gordon Slack to Ms. Orr (Slack Letter). Both contain concerns relevant to this EIS.

The attached comments make the following major points:

I. Ecological Resources

The EIS needs to fully evaluate the concern mentioned in the existing Draft EIS (page 63) that migratory birds are only in Texas and Louisiana. This means that the impact of the migratory birds raised in the existing Draft EIS are not a factor in considering the Mississippi potential location for the new SPR facility.

II. Land Use

- a) The EIS needs to fully evaluate the potential diversion of over one and a quarter billion barrels of brine, containing valuable chlorine, from the US economy and wasting this diverted brine into the Gulf of Mexico.
- b) The EIS needs to fully evaluate the potential that the new SPR facility will create a significantly larger creep and subsidence in an area near important brine, liquid storage and natural gas storage caverns and important commercial pipelines
- c) The EIS needs to fully evaluate the conflict of the SPR oil storage with the developing natural gas storage on the Stratton Ridge salt dome.
- d) The EIS needs to fully evaluate the impact of the security zone on the planned and established local industry.

III. Geological and Soil Resources

- a) The EIS need to fully evaluate the increased creep and subsidence that will be caused by locating the new SPR facility in Stratton Ridge directly under this section.

IV. Public Health and Safety

- a) The EIS needs to fully evaluate the potential impact the security zone will have on the existing and planned industrial facilities.

V. Socioeconomics

- a) The EIS needs to fully evaluate the socioeconomic impact of locating the new SPR facility in currently hurricane devastated states (Louisiana and Mississippi).

VI. Environmental Justice

- a) The EIS needs to fully evaluate the potential benefit from locating the new SPR facility in the recently devastated hurricane states of Louisiana and Mississippi by locating it in a state that has many new low income populations.

By this letter, Dow requests a copy of the Draft EIS and notice of any significant activity related to this EIS.

Paul Bork



[REDACTED]

Thank you for your consideration of our comments and feel free to contact me if you have any questions or wish to discuss our concerns or other things related to this expansion of the SPR.

Sincerely,

Paul Bork
EHS Legal - Freeport
EHS Legal - Mergers and Acquisitions
Six Sigma Black Belt - Legal

[REDACTED]

Comments of The Dow Chemical Company

I. Ecological Resources

Migratory birds only mentioned as being in Texas and Louisiana on page 7-15 of the current Draft EIS, located on page 63 of the electronic version on the DoE web page. Given this documentation of the well known migratory bird passage to and through the wetlands of these states, the EIS needs to address the incremental adverse impact locating the new SPR facility in either Texas or Louisiana. To the extent that the cited statement in the current Draft EIS is correct, the potential site in Mississippi seems to be a clear alternative to adversely impacting the migratory birds that caused the statement in the current Draft EIS, this needs to be evaluated in the Ecological Resources section of the EIS. In any event the relative impact on migratory birds needs to be evaluated for each of the potential sites for the new SPR facility.

II. Land Use

Dow raises four important Land Use issues that the EIS needs to address: The first is the potential diversion of over one and a quarter billion barrels of brine, containing valuable chlorine, from the US economy and wasting this diverted brine into the Gulf of Mexico. The second is the potential creation of significantly larger creep and subsidence in an area near important brine, liquid storage and natural gas storage caverns and important commercial pipelines. The third is the conflict of the SPR oil storage with the developing natural gas storage on the Stratton Ridge salt dome. The fourth is the impact of the security zone on the planned and established local industry. All of these important Land Use issues are resolved if the chosen location is a location other than Stratton Ridge.

First, the EIS needs to address the impact of wasting the chlorine from the Stratton Ridge salt dome. This is salt that is located near a major commercial chemical facility that is currently using salt solely from the Stratton Ridge salt dome to produce chlorine that is either itself in many products or used in the manufacturing of many products. In addition the chlorine produced from Stratton Ridge salt is used in products that are critical in providing many services. See Testimony for a discussion of the utility of Chlorine.

All of the potential locations for the new SPR facility do not have the potential for use of the salt for chemical manufacturing. This location specific aspect of wasted essential natural resources needs to be evaluated in the Land Use section of the EIS.

The magnitude of the potential salt diversion/waste can be calculated from two of the figures in the DoE's *Proposed Action Information* pamphlet distributed in the public meetings associated with the public comments this EIS scoping effort. On page 3 of that pamphlet, DoE says that the proposed new SPR facility will have up to 160 million barrel of oil storage capacity and that leaching a cavern generates approximately 8 barrels of brine for each barrel of created cavern space. This means that locating the new SPR facility in Stratton Ridge will potentially divert 1,280,000,000 barrels of brine from the US economy and waste it into the Gulf of Mexico.

Second, the adverse impact the potentially increased subsidence, discussed in the *Geological and Soil Resources* section of these comments, will have on the existing commercial pipeline corridors and their included pipelines caused by locating the new SPR facility on the well developed Stratton Ridge salt dome needs to be evaluated in the Land Use section of the EIS. In making this comparison in the Land Use section of the EIS, DoE needs to have the base case the lesser subsidence caused by the continuation of the existing rate of development of the Stratton Ridge salt dome. If the leached salt continues to be consumed by the nearby chemical facility, the rate of development can be easily calculated.

Third, the potential adverse impact of the locating of the new SPR facility on the Stratton Ridge on the developing natural gas storage industry related to the Freeport Liquid Natural Gas terminal (FLNG). While over a handful of Liquid Natural Gas terminals (LNG) have been proposed, the FLNG is the only one moving forward into the construction phase. There are commercial transactions related to the construction of storage wells. Given the well developed nature of the Stratton Ridge salt dome, taking the only large property remaining on the salt dome for oil storage prevents the expansion of natural gas storage on the Stratton Ridge salt dome. Given the even more critical need for natural gas development in the energy policy of the US, it would be an inappropriate use of DoE resources to quench this ongoing commercial development in the natural gas area in locating the new SPR facility on the Stratton Ridge salt dome. DoE has a greater ability to construct the pipelines and spend the capital needed to develop a salt dome farther from commercial pipelines than does industry. DoE needs to spend its resources in a way that supports the current and developing land use and that encourages developing industry in the natural gas storage area.

Dow incorporates as if set forth in full in these comments, the DoE discussion of the importance of natural gas storage on its web page <http://www.fossil.energy.gov/programs/oil/gas/delivery/index.html>. Dow mentions the discussion in the attached Slack Letter of the impact of the energy crisis and the impact of natural gas pricing and availability on Dow, the chemical industry and the US industry in general. Dow also mentions the discussion of the energy crisis and the impact of natural gas pricing and availability on Dow and the chemical industry.

Fourth, the EIS needs to evaluate the potential adverse impact the established security zone that will be established around the new SPR facility will have on planned and existing industrial facilities. The well developed Stratton Ridge salt dome will have more extensive potential adverse impacts than would location of the new SPR facility at a less well developed site.

III. Geological and Soil Resources

Dow raises one important issue that the EIS needs to evaluate in the *Geological and Soil Resources* section of the EIS and consider the adverse impact that the new facility may have on Geological and Soil Resources. The Stratton Ridge, Texas salt dome has been extensively developed. The parcel of land proposed for the location for the SPR new

location is the only large parcel of land not already developed or under development on the Stratton Ridge salt dome. Locating the same series of caverns for oil storage on such a well developed salt dome will increase both the creep and subsidence in comparison to the same series of caverns for oil storage on a salt dome that is not developed to the same extent. The EIS needs to take the existing and planned (permitted) wells on salt domes to have a valid comparison of the creep and subsidence between the various alternative locations for the new SPR location. First, the adverse impact on existing and planned salt, liquid storage and gas storage caverns on Stratton Ridge needs to be evaluated. Second the adverse impact on planned and existing pipelines, including those in the nearby existing commercial pipeline corridors needs to be evaluated.

IV. Public Health and Safety

Dow raises one concern in the *Public Health and Safety* section of the EIS. The Stratton Ridge potential site for the new SPR facility is very close to existing security from existing and planned industrial facilities. The EIS has to evaluate the potential for the security of the new facility adversely interacting with the existing security from existing and planned industrial facilities and resulting in a decrease in the safety provided both by the new SPR facility and the existing industrial facilities.

V. Socioeconomics

- a) Dow cites Testimony for a discussion of the well known devastation caused by the recent hurricanes to the states of Louisiana and Mississippi. Everything else being equal, there would be a greater societal value for the funding and jobs associated with the new SPR facility to be located in Louisiana or Mississippi than Texas. This aspect of the *Socioeconomics* needs to be carefully and fully evaluated by the EIS.

VI. Environmental Justice

- a) Dow cites Testimony for a discussion of the well known devastation caused by the recently devastated hurricanes states of Louisiana and Mississippi. There are many newly low-income people created in Louisiana and Mississippi. While Environmental Justice has historically focused solely on the adverse effect of the proposed project, Dow suggests that DoE takes a larger view of Environmental Justice and weighs the good locating a project in a devastated area can cause relative to locating the project in another location. If the beneficial aspects of locating the new SPR facility in Mississippi or Louisiana outweigh the harm, Dow suggests that the Environmental Justice aspect of the EIS be weighed in favor of locating the new SPR facility in Mississippi or Louisiana. This project may well be one that has a positive overall impact from the location, from an Environmental Justice perspective.

Appendix

October 4, 2005

Ms Renee Orr, 5-Year Program Manager
Minerals Management Service (MS-4010)
Room 3120, 382 Elden Street
Herndon, VA 20170

Re: Comments on Preparation of a New 5-Year OCS Oil and Gas Leasing Program
for 2007-2012. 70 Federal Register 49669-49679 (08/24/05)

Dear Ms Orr:

The Dow Chemical Company is pleased to comment on the Minerals Management Service (MMS) Request for Comments on the preparation of a new 5-Year Outer Continental Shelf (OCS) Oil and Gas Leasing Program for 2007-2012. Dow is the nation's leading manufacturer of chemicals, plastics and agricultural products that are essential to a wide range of consumer goods – from automobiles and electronics to household cleaners and personal care products. Because chemical manufacturing is very energy intensive, companies like Dow must have access to a reliable, affordable supply of domestic energy in order to meet the needs of our customers – and to remain globally competitive. Therefore, Dow has a direct and a strong interest in the development of the next offshore leasing program.

In recent years, persistently high and volatile U.S. oil and natural gas prices have threatened the long-term health of our nation's chemical manufacturers. Over the past six years the rising price of natural gas, in particular, has been felt acutely by chemical producers like Dow, because we use natural gas as both an energy source and a critical raw material. This energy crisis has recently been underscored by Hurricane Katrina and Hurricane Rita.

In recent years, Dow has been forced to take aggressive action to mitigate the impact of escalating feedstock and energy costs. We have implemented a companywide cost-reduction plan, improved our energy efficiency, increased productivity, raised the prices of our products, shut down a number of non-competitive U.S. facilities, and shifted some production and jobs overseas – to parts of the world where energy is far more available

and competitively priced. In short, we are doing everything in our power to address this unprecedented challenge – but we are reaching the limit of what we can do without further government action. For the sake of our nation's economy, we absolutely must drive toward environmentally sound production of this nation's vast off-shore energy reserves.

The OCS is vitally important to America's energy security.

The Outer Continental Shelf (OCS) contains huge, untapped resources of oil and natural gas that are critically important to sustaining our national economic growth and maintaining much-needed jobs in virtually every sector of the economy. Therefore we commend the Minerals Management Service (MMS) for asking for comments on all areas of the Outer Continental Shelf (OCS), including the 89% of the lower 48 OCS acreage that remains "off limits" due to moratoria (including, the Atlantic and Pacific offshore and most of the Eastern Gulf of Mexico) as well as the resource-rich areas off Alaska's coast.

We need to fully develop the OCS -- and we urge you to adopt as expansive a 5-year leasing program as possible.

OCS development has been limited for too long to the Central and Western Gulf of Mexico. This has been a vitally important area -- supplying almost 30% of the oil produced in the U.S. and about 20% of the natural gas. As we have been reminded all too starkly by recent events, disruptions in supplies from this area have national implications affecting consumers throughout the country. While this area will remain vitally important, it is clear we must expand energy development to other parts of the OCS.

The next 5-year plan must provide for expanded leasing in the OCS.

While the OCS has played a key role in helping meet US energy needs, particularly the need for clean-burning natural gas, expanded access to new OCS areas is needed to ensure adequate future domestic energy supplies. The Energy Policy Act of 2005 was an important step toward addressing the nation's energy challenges – with its emphasis on energy efficiency & conservation, improved infrastructure, and practical renewables and alternatives such as clean coal and advanced nuclear power. However, U.S. energy policy has not sufficiently emphasized the importance of developing domestic oil and natural gas supplies. As the Congressional Joint Economic Committee pointed out, U.S. policy has encouraged the use of clean-burning natural gas, while discouraging the development of new supplies – an approach that they called "a recipe for problems." The next 5-year plan can take an important step to address American consumers' future energy needs by providing for expanded OCS leasing, including:

- Open the remaining Sale 181 area; it has substantial energy resource potential and access to existing infrastructure that could help speed delivery to energy users.
- Expand acreage offered for lease in Alaska. Alaska's OCS is estimated to contain 122 trillion cubic feet (Tcf) of natural gas and 25 billion barrels of oil – enough

natural gas to heat more than 60 million homes for 30 years and enough oil to fuel more than 50 million cars for 15 years.

- Provide a flexible, timely process for amending the plan to allow inclusion of areas where development is currently prohibited should they be opened to development in the future.

Policymakers intended to use the OCS to support energy development.

The Outer Continental Shelf Lands Act (OCSLA) explicitly recognizes the importance of OCS oil and natural gas production. The OCSLA declares that it is "...the policy of the United States that...the Outer Continental Shelf is a vital national resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs." Further, the 1978 amendments to the OCSLA found that "... increasing reliance on imported oil is not inevitable, but is rather subject to significant reduction by increasing the development of domestic sources of energy supplies..."

Substantial OCS resources could be developed.

Various types of moratoria have restricted energy development by preventing exploration and production off most of the U.S. coastline. Such restrictions mean we are denying American consumers vast domestic energy supplies. For example, there are about 300 Tcf of natural gas and more than 50 billion barrels of oil on the OCS off the 48 states that can be recovered using today's technology but which have yet to be discovered.

To put this in perspective, this is enough oil to maintain current US oil production for more than 80 years and current natural gas production for almost 70 years. Put another way, this is enough oil to produce gasoline for 116 million cars *and* heating oil for 47 million homes for 15 years. Or, it is enough oil to replace current imports from the Persian Gulf for 59 years and enough natural gas to heat 75 million homes for 60 years. Or, it could supply current industrial and commercial needs for 29 years. Or, it could supply current electricity generating needs for 55 years. And, that is before the Alaska OCS is considered, with additional resources of 122 tcf of natural gas and 25 billion barrels of oil. The importance of these resources cannot be overstated.

Current resource estimates could well understate OCS supply potential

Experience suggests that there may be even greater OCS resources than the data show. Current resource estimates may be conservative since the areas are largely unexplored and the estimates have not benefited from the use of new seismic and computer modeling technology. Generally, the more an area is explored, the more its resource estimates grow. For example, government estimates of undiscovered oil in the Central and Western Gulf of Mexico increased by over 400% between 1995 and 2003 and undiscovered natural gas resources by more than 100%.

Failure to expand access will hurt our nation's economy.

Across the nation, Americans will pay a high price if the OCS remains essentially "off limits." The US Energy Information Administration (EIA) forecasts that, by 2025, petroleum demand will increase by 39% and natural gas demand by 34%. EIA also estimates that oil and natural gas will provide nearly two-thirds of the energy consumed in 2025.


In the past two years, higher energy prices have slowed U.S. economic growth by .5 to 1.0% (based on pre-hurricane prices). Since 2000 more than 2.8 million U.S. manufacturing jobs have been lost. The US chemical industry has been especially hard hit. Our industry's natural gas costs have increased by \$10 billion since 2003 – and already \$40 billion in business has been lost to overseas competitors who pay less for natural gas. Chemical companies closed 70 facilities in the United States in 2004 and have tagged at least 40 more for shutdown. Of the 120 chemical plants being built around the world with price tags of \$1 billion or more, only one is in the U.S. Dow has no plans to build in the U.S. given current uncompetitive energy prices.

Expanded OCS access is a national imperative, and the nation just received a wake-up call. The OCS has played a growing role in US natural gas and oil supply for more than 50 years. Technological advances not only helped increase and expand production, but also have assured safe operations that protect the environment. Worldwide, virtually every other country with oil and gas resources is promoting investment in and developing their offshore resources.

The U.S. has an opportunity to improve our energy situation and continue to support economic growth, while providing consumers and businesses with the essential energy that they need. Let's take this opportunity to strengthen the U.S. economy, preserve an essential industry, maintain our nation's leadership in science and technology, and keep more high-wage manufacturing jobs in the U.S. -- by adopting an expansive OCS leasing program.

Dow appreciates the opportunity to comment. If you have any questions, please contact me at [REDACTED]

Sincerely,


Gordon Slack
Energy Business Director
The Dow Chemical Company

The Dow Chemical Company American Chemistry Council

STATEMENT FOR THE RECORD

SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

HEARING ON

Hurricanes Katrina and Rita's effects on energy
infrastructure and the status of recovery efforts in the Gulf
Coast region.

SECTION I Introduction and Executive Summary

"After Katrina we got a call from a bottled water company in the South scrambling to get some HDPE (high density polyethylene plastic). His regular supplier curtailed him. He needed the plastic to make bottles so he could supply bottled water to FEMA. Our Louisiana plants were still restarting, gas supply was curtailed and we were closing our TX plants in anticipation of Rita. We couldn't help him."

Chemical Company Executive Located in Hurricane Zone

The Dow Chemical Company and the American Chemistry Council welcome the opportunity to provide the Committee with an update on Hurricanes Katrina and Rita's effects on energy infrastructure and the status of recovery efforts in the Gulf Coast region.

This topic is of acute interest to the US chemical industry because the Gulf Coast is home to the world's largest concentration of chemical manufacturing capacity. The Gulf is to chemical manufacturing as Wall Street is to finance.

The chemical industry has been operating in the Gulf for more than seven decades. Our engineers and operators are experts in hurricane preparedness. Plants are designed and built to withstand Category Five storms. All members of the American Chemistry Council (ACC), under our trademark health, safety, environment and security program, Responsible Care®, have long-established hurricane plans that operate before, during and after storms. Facilities cooperate with local, state and national authorities, other businesses and transportation systems, along the path of the storms and through recovery. Companies will evaluate and enhance those plans to incorporate learnings from Katrina and Rita as part of their ongoing performance improvement process.

Typically, these emergency plans include the safe shutdown and lockdown of facilities, removal of vehicles and other equipment, evacuation and accounting of employees, and placement of emergency "ride-out" crews on-site, when feasible. We then carefully assess post-storm conditions to allow facilities to resume operations safely.

Having said that, our industry has also been severely damaged by the hurricanes. Not by the high winds and not by the storm surges and floodwaters, but by the high cost and limited availability of natural gas.

Natural gas is of vital importance to our industry. It heats and powers our facilities, but it is also our most important raw material. We process natural gas molecules into thousands of products that can be found everywhere in the economy.

Today, most chemical plants in the Gulf Coast are closed or are operating at reduced rates. For some, it is because they are without power. For others, they have been cut off from their gas supply or they are choosing not to pay today's prices. Soon the loss of chemical manufacturing in the Gulf will ripple through the economy in the form of shortages and higher prices.

The industry faces hard choices on how and where it will base its operations in the future. On September 30, 2005 the wholesale spot price of natural gas was \$14.50 per MMBtu. In Europe natural gas costs about \$7.00. In China, it's less than \$5.00. In Saudi Arabia, it's less than \$1.00. US manufacturers must compete in global markets. Companies must decide where to locate production, where to locate jobs, where to pay taxes and support communities. When US production costs two to twenty times more than it does in the rest of the world, it is hard to justify investing in America.

Public policy makers will exert enormous influence on how those decisions are made. It is well documented how certain policies bid up demand for natural gas to make electricity in the US and other policies restrict access to supply. What is not as well known is that the manufacturing sector pays the price for those policy decisions. In the recent past, policy decisions costs the US chemical industry dearly. Policy induced price gyrations between 2000 and 2005 handed overseas chemical operations a huge competitive advantage: The US chemical industry went from posting the largest trade surpluses in the nation's history in the late 1990's to becoming a net importer. In that time, the industry lost more than \$50 billion in business to overseas operations and more than 100,000 good-paying jobs in our industry have disappeared. The National Association of Manufacturers reports that 2.9 million American manufacturing jobs disappeared in that time.

Policy makers are again in a position to influence the US manufacturing environment. The short-term outlook for natural gas consumers is grim. Until very recently, government officials had severely underestimated the combined impact of the two hurricanes (especially Rita) on the nation's energy infrastructure. As of this writing, nearly 100 percent of the Gulf of Mexico oil production and 80 percent of natural gas output remain shut in. More than 20 natural gas processing plants on shore are closed, some are damaged, some have no power. Pipelines are not fully operational. Eight refineries remained closed and eight are restarting. Power remains out in the Beaumont-Port Arthur-Lake Charles area.

ACC is doubtful that the Gulf's energy infrastructure will be fully restored before the winter heating season starts. There is no surplus natural gas production capacity available to fill the void. There is not a "Strategic Natural Gas Reserve" available to make up for supply disruptions. Natural Gas will be in short supply this winter.

Natural Gas consumers will be competing for a scarce commodity. Policy makers can cushion the blow, if swift action is taken to stretch the supply and curb consumption. We recommend the following:

1. Send a powerful message to the markets by eliminating barriers to energy production in the Outer Continental Shelf (OCS) and share revenues on new production with states.
2. Expedite leasing in the area of the eastern Gulf of Mexico known as Lease Sale 181, at least for areas greater than 100 miles from the coast of Florida.
3. Declare a national emergency before winter, shock national awareness of supply problem and mobilize federal resources

4. Give priority to dispatching highly efficient CHP and Natural Gas Combined Cycle generating capacity to the grid.
5. Restore service to damaged natural gas processing plants on the Louisiana coast.

More detailed policy recommendations are contained in Section V

If the right responses are put in place right away, tensions in the market can be eased and gas consumers can weather the current crisis. If prices remain at or near current levels, manufacturers will be driven out of the market and many may not return.

SECTION II The US Chemical Industry at a Glance

The chemical industry fuels the American economy.

- The chemical industry is the leading American export industry accounting for 10% of all U.S. exports.
- We generate more than half a trillion dollars to the U.S. economy each year.
- The chemical industry has created a \$154 billion trade surplus over the past ten years.
- The industry directly employs more than 885,000 people, a figure larger than the combined populations of Boston and Buffalo.
- Chemistry dependent industries account for nearly 37 million jobs or 26.6% of the entire workforce.

The chemical industry improves our health and keeps our families safe.

- New drugs and medicines made possible by chemistry have increased life expectancy in the US by more than 30-years over the past century.
- A plastic bicycle helmet, one of the chemistry industry's most popular innovations, can reduce a child's risk of head injury by 85% according to Safe Kids USA.
- 98% of all U.S. public drinking water is safe to use because of chemistry.
- According to the National Highway Traffic Safety Administration, more than 14,000 lives have been saved thanks to airbags, a product of chemistry.

Chemistry is essential to U.S. business and industry.

- The chemical industry supplies the raw materials used by virtually every industry from aircraft construction to zoo management.
- More than 80% of the materials used to formulate all medicine come from the chemistry industry.
- The chemical industry is America's second largest rail shipper.
- The major innovations over the past century that have increased productivity from the phone, computer and Blackberry exist because of chemistry.

Chemistry is at the heart of innovation, helping to make our lives better, healthier and safer.

- The chemical industry invests more than \$22 billion a year in research and development – the most of any single industry outside of national defense.
- One out of every eight new patents is awarded to the chemistry industry.
- The American chemical industry employs the highest percentage of knowledge workers of any industry and employs more than 80,000 chemists, scientists and engineers.

SECTION III Hurricane Katrina & Rita: Ripple Effects from Shortages**Potential Product Shortages Following Hurricanes Katrina and Rita**

Some of the most commonly used consumer and industrial products may be in short supply in coming months due to North American chemical capacity shut-ins following the hurricanes in the Gulf of Mexico. Following are some examples of products for which there may be shortages.

- **Tires, radiator and other hoses, fan belts, and bumpers; seals and gaskets; automotive belts and hoses, asphalt binder and roofing.** (62 percent of North American butadiene capacity, used to make these products, is down)
- **Oil, milk, detergent bottles; gasoline tanks; corrugated and drainage pipe.** (55 percent of North American high density polyethylene capacity, used to make these products, is down.)
- **Syringes, medical fabrics, automotive battery cases, dairy containers, diaper coverstock, and food packaging.** (55 percent of North American polypropylene capacity used to make these products, is down).
- **Diaper liners, shrink film and bread bags.** (46 percent of North American low density polyethylene capacity, used to make these products, is down).
- **Plastic resins, films and bottles; automobile antifreeze blends, including those for military vehicles, and for de-icing runways and aircraft; fire extinguishers and sprinkler systems.** (39 percent of North American ethylene glycol capacity, used to make these products, is down)

Source: CMAI, petrochemicals consultant (www.cmaiglobal.com)

SECTION IV Background: The importance of affordable energy to the US Chemical Industry, How the natural gas crisis

developed, and what the Energy Policy Act of 2005 accomplishes

America's chemical industry is the nation's largest energy consumer. We use energy – especially natural gas – to heat and power our facilities, and as a raw material to make thousands of products consumers use every day. Chemical companies use more natural gas than California and more electricity than the state of New York. The chemical industry consumes enough natural gas to heat 30 million homes a year – almost half of the nation's home heating needs

Natural gas can do amazing things. It can be used to heat and cool a home, to make electricity and as a key ingredient in products – lots and lots of products. These include medicines, medical equipment, packaged goods, military applications and others. Numerous “downstream” industries rely on natural gas-produced chemistry products, including agriculture, steel, aluminum, and cement.

Advances in Energy Efficiency

Fortunately, the chemical industry has made great strides in energy efficiency. For example, we can make a pound of product with half as much energy as it took a generation ago. But even with these efficiency improvements, an immense amount of energy is still required for chemical manufacturing. Chemical makers need more energy than the entire country of Mexico, and roughly the same amount as Brazil.

Many chemistry products that are made with natural gas help make other parts of the economy more energy efficient. Energy-saving products such as insulation, lightweight vehicle parts, advanced window systems and reflective coatings are all made from chemicals made from natural gas.

Supply/Demand Imbalance Leads to Skyrocketing Natural Gas Costs

The problem is, America is using more and more natural gas and producing less and less. As a result, the price of natural gas has increased by 700 percent since the late 1990's. If the same thing happened to gasoline, prices at the pump would be more than \$7.00 a gallon.

For industries like ours, those high prices hurt. In 1999, the chemical industry paid about \$25 billion for all of its energy inputs – fuel, power and feedstocks such as natural gas. Last year, the tab topped \$52 billion. Beginning in 2000, the industry has shelled out \$80 billion more for energy than it was paying in the 1990's.

The effect of those additional costs – think of it as a huge energy tax – has been severe. We've seen a 20 percent decline in natural gas consumption in the chemical industry. Call it demand destruction. Dozens of plants around the country have closed their doors and gone away – and are never coming back.

US chemical industry domestic operations lost \$50 billion in business to overseas operations since 2000. We went from posting trade surpluses in excess of \$20 billion – the most successful export

industry in the history of this nation – to becoming a net importer of chemicals. More than 100,000 American jobs have been displaced, in large part due to the hidden “energy tax.”

Not long ago, *Business Week* noted that of the 120 large-scale chemical plants under construction around the globe, only one is being built in the United States. The plants under construction are located in places where natural gas supply is abundant, reliable and affordable.

Unlike oil, natural gas is a regional commodity, not a global one. And US natural gas prices are the highest in the world – at the moment, US gas prices are 20 times higher than in Saudi Arabia.

Impact of Government Policies on Natural Gas Supply, Price

In the 1990’s, new government regulations began driving electric utilities to reduce air emissions by burning natural gas to make power. An enormous amount of gas-fired power generation capacity came on line in the past decade. Utility consumption of natural gas grew by 31 percent in a few short years.

The nation’s appetite for electricity is rapidly growing and is expected to increase by as much as 50 percent in the next 20 years. Natural gas supply cannot meet incremental demand. The government says that new supplies of domestically produced natural gas will only meet 30 percent of future demand growth. Quite simply, there’s not enough gas to go around. To meet this challenge, the U.S. must meet its growing energy needs by investing in new technologies that produce power from renewables (for example wind and solar), non-polluting nuclear, agricultural sources of energy (sometimes called biomass) and low-polluting coal power.

Energy Policy Act of 2005

In August of 2005, the president signed into law a sweeping new energy bill called the Energy Policy Act of 2005. On balance, it is a very good policy and, over the long haul, it can change the way the nation makes and uses power. The legislation breaks new ground in the area of energy efficiency: We will see new standards of performance for appliances, homes and buildings as a result of the legislation’s efficiency measures.

It also makes a serious effort to diversify the energy supply – to move away from the natural gas-is-the-answer-to-everything mentality that dominates current policy. The legislation will launch a new generation of technologies used to make power, including coal gasification, renewable energy and nuclear power.

The nation’s energy infrastructure will get a much-needed facelift. The legislation will lead to new investment in gas pipelines and storage facilities and will result in new LNG terminals.

SECTION V: Unfinished Business. New policies needed in the post-

Hurricane period

Expand natural gas supplies and reduce concentration of nation’s energy infrastructure in three ways:

- eliminate barriers to energy production in OCS and share revenues on new production with states. MMS estimates that OCS contains 406 TCF of recoverable natural gas. More

than 85 percent of OCS is off-limits to use as a result of federal policies set in place 25 years ago when NG was cheap and plentiful;

- increase gas production on shore by removing red tape and seasonal restrictions;
- accelerate and increase tax credits and guarantees for investing in gasification technologies for the production of fuels and feedstocks;
- expedite leasing in the area of the eastern Gulf of Mexico known as Lease Sale 181, at least for areas greater than 100 miles from the coast of Florida.
- Site new LNG terminals, especially on Atlantic and Pacific coasts. Set a goal of four new terminals (not all on Gulf Coast) by 2010.

Restore lost gas and oil production. The government should use its authority to speed emergency reconstruction of damaged pipelines (Emergency Reconstruction of Interstate Pipeline ruling of 2003) and implement other red-tape cutting measures to restore damaged drilling rigs and production platforms. The government should also employ the Coast Guard, Army Corps of Engineer and other federal assets as needed to speed repairs of damaged production sites and infrastructure. **Priority should be given to restoring service to damaged natural gas processing plants on the Louisiana coast.** In addition to removing sulfur and other impurities, these plants also remove natural gas liquids, such as ethane and propane, primary chemical feedstocks. Three of those damaged plants process the equivalent of three LNG terminals. Help is needed to transport and house repair crews, pump out the plants, restore power, repair damages and resume operations.

Encourage Efficient Consumption. To avert shortages this winter and in future years, actions are needed now to ease the strain on natural gas markets. In the short term emphasis should be placed on reducing gas demand through **conservation and efficiency measures**. These immediate actions are needed:

- Declare a national emergency before winter, shock national awareness of supply problem and mobilize federal resources, including...
- Fund in 05 the national public education campaign authorized in Title I of EPACT05. Doing so will harness the American people's strong desire to "do something" to help recovery efforts. Little actions can achieve big results. If all Americans turned down their thermostats by 2 degree this winter, it would free up 3 BCF of gas per day.
- Move up to Oct. 1, 2005 effective date for tax credits authorized in EPACT05 for homeowners, builders and commercial building owners for investment in energy efficiency.
- Require up-to-date building codes in states using federal funds to recover from the hurricanes and encourage all states to use most current codes.
- Accelerate completion of tardy appliance codes and development of new codes authorized in the energy bill.
- Expand and spotlight The Partnership for Home Energy Efficiency (DOE, HUD, EPA).
- Expand funding for weatherization programs and dispatch crews to go into homes, audit energy consumption, and install weatherization materials and equipment as needed.

Encourage Efficient Generation: In many parts of the country inefficient natural gas power generators supply baseload power and highly efficient generation is reserved for peak demand. To make power generation more efficient, the following actions are needed:

- Build new and efficient transmission capacity in order to remove system constraints.
- Retire or put in reserve inefficient single-cycle generation capacity
- Give priority to dispatching CHP and Natural Gas Combined Cycle capacity ... restore CHP tax incentives.

Diversify Fuel Supplies. The large build up of natural gas fired power generation in recent years is putting an unsustainable strain on natural gas supplies. Gas consumption for power generation increased by 25 percent this summer, driving prices up from \$6.00 to nearly \$10.00 per million BTU. Utilities should be encouraged to make power from other fuel sources, by:

- Accelerating coal and biomass gasification. The US has the world's largest reserves of coal and (potentially) biomass. Gasification technology is ready for deployment and the government should help speed up commercial use by utilities.
- Site new nuclear power. Nuclear answers environmental and energy questions. The government should consider building new reactors on federal lands.

Distribute energy supply and power generation. The Hurricanes proved that the entire nation can be affected by regional disruptions and the energy infrastructure is highly reliant on the integrity of the electrical grid. To reduce economic and national security vulnerabilities government should:

- Create incentives for refineries, pipelines and large energy using industrial, institutional and commercial facilities to produce heat and power on site
- Encourage all states to implement "efficient portfolio standards" defined to include renewables, CHP, gasification and other low-polluting means.

Increase Natural Gas storage capacity to make the natural gas system more resilient. The Strategic Petroleum Reserve did its job and restored calm to jittery oil markets. Natural gas does not have adequate reserve capacity and that contributes to price volatility. Additional storage capacity would help the market adjust to temporary supply shortages.

Hurricane Katrina & Rita: Ripple Effects from Shortages

(Source: CMAI and ACC)

Acrylonitrile – 55% of North American acrylonitrile capacity is down. It is used to manufacture ABS resins for automotive trim, irrigation, and office equipment, telecommunications and appliance housings and to manufacture SAN resins used in medical housings and industrial batteries, among other applications.

Butadiene – 62% of North American butadiene capacity is down. It is the primary olefin used to make a variety of synthetic elastomers including: styrene-butadiene used in tires, radiator and other hoses, fan belts, and bumpers; polybutadiene used in seals and gaskets, belts, and tires; and polychloroprene used in automotive belts and hoses, asphalt binder, and roofing.

Chlorine – 16% of North American chlorine capacity is down.

It is used directly in water treatment, paper manufacturing, and in the production of certain lightweight metals (titanium and magnesium) used in aircraft. Indirectly, it is used to make a variety of important building-block chemicals, such as trichloroethylene, phosgene, chlorinated hydrocarbons, neoprene, polyvinyl chloride (PVC), hydrogen chloride, and ethylene dichloride. In turn, these are used to ultimately produce thousands of industrial and consumer products. Some indirect applications include the production of pharmaceuticals, wool, flame retardant materials, and special batteries (lithium and zinc). Chlorine is also used in the processing of fish, meat, vegetables, and fruit. The largest end uses of chlorine include the making of ethylene dichloride, vinyl chloride monomer, and PVC resins (used to make a variety of products such as medical bags and tubing, adhesives, protective clothing, pipes, siding for homes, and raincoats).

Caustic soda is co-produced with chlorine and a similar share is down. Caustic soda is used in glass making and variety of products. It's used in epichlorohydrin used in glycerin for food products as well as epoxy resins for coatings, aircraft composites, dry toner resin, electronic encapsulants, automotive leaf springs, printed circuit boards, etc. Caustic soda is used to manufacture carbomethylcellulose for oil drilling muds, food processing, and pharmaceuticals. Caustic soda is used to manufacture sodium citrate used as a food conditioning agent in cheese and meat as well as in detergents. Caustic soda is used to manufacture polycarbonate used for eyeglass lenses, helmets, computers, and CDs.

Cyclohexane – 80% of North American cyclohexane capacity is down. It is used to manufacture nylon resins used in electrical and automotive components, wire jackets, non-textile monofilament, and tool housing as well as nylon fibers used in parachutes and other textile applications.

Ethylene Glycol – 39% of North American ethylene glycol capacity is down. Most ethylene glycol produced is used to make polyethylene terephthalate (PET), which is used to make plastic resins, films, and bottles. The other major end use is as a coolant in automobile antifreeze blends, including for military vehicles. It is used in de-icing runways and aircraft. It is also used in fire extinguishers and in sprinkler systems. Army boot soles are derived from ethylene glycol.

Ethylene Oxide – 43% of North American ethylene oxide capacity is down. The largest share is used to make ethylene glycol (which is used to make polyester fibers/resins and antifreeze). The next largest application is in the making of surfactants and detergents. This chemical is also used to make other chemicals, such as ethanolamines (used for gas conditioning and soap production) and glycol ethers (used to make paint, brake fluids, aircraft fuel additives). Ethylene oxide is also

used as a petroleum demulsifier, as a fumigant, in the making of rocket propellant, and as a sterilizing agent for industrial applications.

HDPE – 55% of North American HDPE (high density polyethylene) capacity is down. Important products made from HDPE include oil, milk, and detergent bottles, as well as conduit, gasoline tanks, and corrugated and drainage pipe.

LDPE – 46% of North American LDPE (low density polyethylene) capacity is down. Important products made from LDPE include diaper liners, shrink film, and bread bags.

LLDPE – 73% of North American LDPE (linear low density polyethylene) capacity is down. Important products made from LLDPE include chemical tanks, trash bags, pallet wrap, produce bags, food storage bags, and landfill liners.

Methyl Methacrylate - 69% of North American methyl methacrylate capacity is down. This is used to manufacture acrylic paints as well as acrylic resins used in disposable and reusable medical devices, especially in the area of drug delivery components and diagnostics. Other resin applications include automotive tail lights, instrument cluster lenses, optical disks, glazing, and safety signs.

Phenol - 38% of North American phenol capacity is down. It is used to manufacture bisphenol-A which is used to manufacture polycarbonate resins (eyeglass lenses, safety helmets, etc.) and caprolactum used to manufacture nylon resins (fan blades, brake reservoirs, etc.) Phenol is also used to manufacture phenolic resins used in structural panels for reconstruction.

Polybutadiene - 84% of North American polybutadiene capacity is down. It is used in seals and gaskets, conveyor belts, and the tread for automotive tires.

Polypropylene – 55% of North American polypropylene capacity is down. Important products made from polypropylene include syringes, medical fabrics, automotive battery cases, dairy containers, diaper coverstock, and food packaging.

PVC – 21% of North American PVC capacity is down. PVC resins are used in pipe, conduit, siding and other construction products needed for re-building after Katrina and Rita. Vinyl resins are also used in IV and other medical tubing and bags.

Styrene - 85% of North American styrene capacity is down. Styrene is used to manufacture polystyrene, ABS & other styrenic resins, SB latex used in carpeting, unsaturated polyester, and SBR elastomers. The latter is the key elastomer for tires, radiator hoses, and fan belts

Styrene-Butadiene Rubber (SBR) - 55% of North American SBR capacity is down. It is the key elastomer for tires (it provides abrasion resistance), radiator hoses, and fan belts

Notable Quotes

“Chemical companies have been under assault for several years’, said Robert Koort, an analyst at Goldman Sachs who has an attractive rating on the chemical sector.”

“As Natural Gas Prices Rise, So Do the Costs of Things Made With Chemicals,” The New York Times, September 28, 2005

“The chemical industry also has been sluggish with rising fossil fuel prices, in the form of natural gas. Now its customers must deal with potential shortages.”

“Spikes and Shortages Go Far Beyond Gas,” The Washington Post, September 2, 2005

“While there is concern about high gasoline prices, a more serious impact may be felt this winter with regards to natural gas, with sky-high winter utility bills looming. On an ominous note, natural gas prices on the New York Mercantile Exchange closed Thursday at the highest level since 1990.”

“Rita Adds to Gulf Gas Woes as Shut-ins Mount in Wake of Storm,” Natural Gas Week, Sept. 26, 2005

“Natural gas prices set a record yesterday, pointing to sharply higher heating bills for a majority of Americans this winter and soaring costs for makers of plastics and chemicals, which use natural gas as their main fuel and raw material.”

“Heat Costs Expected to Surge: Natural Gas Price Continues Climb,” The New York Times, Sept. 30, 2005

“Natural gas not only fuels chemical plants, but it is used to extract chemical ingredients...Natural gas prices, which were already high, soared after Katrina. They have more than doubled in the last year. The complications from Rita are expected to boost prices on a whole range of products from milk containers to computers to pharmaceuticals.”

The Nightly Business Report, PBS, Sept. 23, 2005

“American industry consumes a third of the country’s natural gas, while residential use is less than a quarter. As a result of the current supply crunch, prices for all sorts of goods are likely to rise, some products may be in short supply and the flow of U.S. jobs to overseas plants may increase.”

“The Other Gas Crisis: Katrina’s Blow to Natural Gas Will Pinch Chemical Makers, Cost Jobs and Raise Prices for Cars and Shampoo,” CQ Weekly, Sept. 19, 2005.

“The Institute for Supply Management, which issues a monthly report on the U.S. industrial sector, reported this week that prices manufacturers are paying for goods surged in August. Rising energy costs pushed a key index measuring prices to 62.5 from July’s 48.5.”

“Cost of Warm, Stocked House Surges; Household Goods’ Raw Materials Scarcer,” The Baltimore Sun, September 3, 2005.

"Industry groups, including the American Chemistry Council, argue it is important to find more natural gas to get prices down. The fuel, which has increased five-fold in recent years, not only is used widely to heat homes and for electric power but also in the making of fertilizer and other chemical products."

"Katrina Spurs New Debate on Energy Policy," Associated Press, September 12, 2005

"Although not as prominent as oil – its fossil fuel cousin – natural gas is used for heating and cooking in over 61 million homes, according to the U.S. Energy Information Administration. Nearly 25 percent of the country's electricity comes from gas."

"Natural Gas Prices Put U.S. Jobs and Businesses At Risk," CQ Green Sheets, Sept. 22, 2005

"The U.S. Energy Information Administration estimates natural gas prices could rise by 71 percent in the Midwest and an average of 50 percent nationwide. And Mother Nature may yet again make the problem worse...If we have a particularly cold winter, an unusually cold winter, the market will be even then much tighter."

The Today Show, NBC News, Sept. 29, 2005

"The Energy Information Administration predicts that natural gas prices will remain above \$10 per million cubic feet throughout peak winter demand. EIA analysts estimate that the average Midwestern household will pay between 71 percent and 77 percent more for natural gas this winter compared to last year."

"Bingaman Says Agencies Must Immediately Implement Energy Law," EnergyWashington Week, Sept. 28, 2005

"The U.S. Interior Department reported that as of September 29, 2005...shut-in [natural] gas production [in the Gulf of Mexico, following the hurricanes] is 7,979 cubic feet (79.79 percent of the daily production.)"

"Hurricane Update," CMAI, petrochemicals consultant, Sept. 29, 2005

"Marshall Steeves, energy analyst at Refco in New York,...said [natural] gas traders are worried about the amount of supply affected by the recent hurricane. A US government report this week raised the amount of natural gas production shut down in the US Gulf of Mexico from 78 to 80 per cent. 'The market has been looking for more gas to come back into production. Instead there appears to be more output affected than we first thought,' he said."

"Natural Gas Prices Rise to Record High," Financial Times, Sept. 30, 2005

"[Senator Jeff] Bingaman's letter to Energy Secretary Samuel Bodman urges the [Dept. of Energy] to take action to reduce natural gas demand by consulting with states, consumers and industry to develop an action plan. The first step would be to initiate a public outreach similar to the one employed in California during the 2000-01 energy crisis. The Energy Policy Act of 2005 authorizes \$90 million a year for DOE to implement a conservation campaign. 'I urge you to initiate a public outreach program targeted at natural gas this fall,' wrote Bingaman."

"Bingaman Says Agencies Must Immediately Implement Energy Law," EnergyWashington Week, Sept. 28, 2005

"Natural gas again hit record highs Wednesday as the delay in restarting production in the Gulf of Mexico worries investors that damage may be more severe than expected... ...The hurricanes boosted prices for natural gas more than for other commodities because the country cannot import enough gas to make up for possible deficiencies. Moving natural gas long distances involves liquefying the gas, and the country has limited facilities to process such gas. 'Industry is starting to realize that natural gas is scarce. There's no such thing as a strategic natural gas reserve. We're on our own,' said Walter Otstott, a trader with Dallas Commodity Co."

"Natural Gas Hits Record: Production Delays Spur Fears That Rita Damage Is Worse Than Expected," *The Dallas Morning News*, Sept. 29, 2005